Narrative for Ts. 3 & 4 S., Rs. 14 & 15 W.,
Sweetgrass and Stillwater Counties, Montana

Introduction

The subject four township area is shown as an inset on the 1:100,000 scale Red Lodge quadrangle, as revised for the Custer National Forest. Only the southern three-fourths of T. 4 S., R. 15 E., and less than oneðhalf of T. 4 S., R. 14 E. fall within the boundaries of the Red Lodge quadrangle. The additional 101 square miles include portions of both Custer and Gallatin National Forests. Of the 144 total square miles in these townships, about 15 square miles are in fee ownership, 480 acres are Montana State lands, and 80 acres are Bureau of Land Management lands. The Gallatin National Forest administers about 69 square miles and the remaining 59 square miles are administered by the Custer National Forest. Surface elevations range from 9995 feet at Picket Pin Mountain in the southwest corner to about 4800 feet along drainages in the northeast and southeast corners. The Forest boundary between the Custer and the Gallatin is along a drainage divide separating generally east flowing streams that reach the Stillwater River, and generally north flowing streams that reach either the Boulder or the Yellowstone River. Except for the southeast threeðquarters of T. 4 S., R. 15 E., auto access is primitive to non-existent. There are no services within the subject area. Nye is a very small community just outside of the subject area. About 6 miles southeast of Nye is the very small community of Fishtail. About 20 miles east is the small town of Absorkee.

Geologically the southwest part of T. 4 S., R. 14 E. contains rocks of the 3.1 billion year old Stillwater complex which is exposed along the northeast edge of the PreCambrian rocks of the Beartooth Front. Paleozoic and Mesozoic sediments (Cambrian through Cretaceous Colorado shale) are exposed in a northwestðsoutheast band about 6 miles wide between the Stillwater complex and a large area of Cretaceous volcanics that cover the northeast oneðhalf of this four township area. Scattered through the sedimentary exposures and the volcanic field are Tertiary coarse grained intrusions. The sedimentary section of Cambrian, Ordovician, Devonian, Mississippian, Pennsylvanian, Permian, Jurassic and Cretaceous rocks have all been found to be productive of oil and gas in the Big Horn Basin 60 miles southeast. Gas and low gravity oil (10ð11 gravity) are produced from lower Cretaceous Greybull sandstone at Dean Dome only about 6 miles to the southeast. The type log in sec. 3, T. 4 S., R. 15 E. drilled through 2565 feet of volcanics, emerging into lower Cretaceous Colorado shale. The Mississippian Madison was penetrated only 54 feet. Of note in this well was a good development of Lakota and 23 feet of good porosity in the top of the Tensleep sand. The Greybull sand was tight but, due to its depositional environment, an offset well could encounter 20 feet of good porosity.

Occurrence Potential

Areas of outcrop of the Precambrian Stillwater complex and of Tertiary intrusions are considered to be of VERY LOW occurrence potential. Areas of lower Paleozoics, vertical dips and metamorphism are considered as LOW occurence potential.

An area covered, in large part, by Cretaceous volcanics is considered as HIGH occurrence potential. Two wells have confirmed the presence a full sedimentary section beneath the volcanics and since the Greybull and Lakota sands produced within 6 to 12 miles it is believed that structural and stratigraphic traps are probably present under a portion of the volcanic field.

The remaining areas under the volcanics and closer to the Tertiary intrusions are considered to be of MODERATE potential. Also, that area from the Nye - Bowler lineament southwestward toward the Stillwater complex is believed to be of MODERATE occurrence potential.

Development Potential

The areas of VERY LOW occurrence potential are, naturally, also areas of VERY LOW development potential. All of the remaining lands are considered to be of LOW development potential. One or two wells may be drilled in the upcoming 10 to 15 years. Of course, a discovery would change this prediction by a factor of 10.

There are no lands in this four township area of either MODERATE or HIGH development potential.

References

Blackstone, D. L. Jr., 1986, Structural Geology Northwest Flank of Big Horn Basin: Park County, Wyoming and Carbon County, Montana in Geology of the Beartooth Uplift and Adjacent Basins; Garrison, Paul B. (ed.), Montana Geological Society and Yellowstone Bighorn Research Association Joint Field Conference and Symposium, YBRA 50th Anniversary Edition.

Grauman, John E; French, Don E.; and Tonnsen, John J., 1986 Occurrence of Petroleum and an Overview of Drilling Activity Around the Periphery of the Beartooth Uplift, Montana and Wyoming in Geology of the Beartooth Uplift and Adjacent Basins; Garrison, Paul B. (ed.), Montana GeologicalSociety and Yellowstone Bighorn Research Assocation Joint Field Conference and Symposium, YBRA 50th Anniversary Edition.

Ross, C. R.; Andrews, D. A. and Witkind, I. J., compilers 1955, Geologic Map of Montana, scale 1:500,000, U.S.G.S.